IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit	: 1793	**Customer No. 035811**
Examiner	: Deborah Yee	
Serial No.	: 10/566,852	
Filed	: February 22, 2006	Docket No.: JFE-05-1840
Inventors	: Hiromi Yoshida	
	: Kaneharu Okuda	
	: Toshiaki Urabe	
	: Yoshihiro Hosoya	
Title	: HIGH-STRENGTH STEEL	Confirmation No.: 9915
	: SHEET HAVING EXCELLENT IN	
	: DEEP DRAWING CHARACTERISTICS	
	: AND METHOD FOR PRODUCTION	
	: THEREOF	

DECLARATION OF KANEHARU OKUDA

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Kaneharu Okuda, a citizen of Japan, declare that I reside at c/o Intellectual Property Department, JFE Steel Corporation, 2-3, Uchisaiwai-cho 2 chome, Chiyoda-ku, Tokyo 100-0011 Japan, that I am one of the inventors named in the above-identified US Patent Application, that I am thoroughly familiar with the above-referenced patent application and the invention described and claimed therein;

My educational background is summarized as follows:

April 1985: I entered the Fourth Course of the Tohoku University.

April 1989: I entered the Department of Metallurgical Engineering, Graduate School of Engineering, Tohoku University.

March 1991: I graduated from the Graduate School of Engineering, Tohoku University.

My work experience is summarized as follows:

1. Kawasaki Steel Co.

April 1991: I was employed by Kawasaki Steel.Co.

1991 to 2003: I worked at the Thin-Sheet Research Department, Research Laboratories, wherein I was engaged in research concerning the development of formable high-strength steel sheets.

2. JFE Research Laboratories:

April 2003 to present: I worked at the Automotive Sheet Products Research Department, wherein I was engaged in research concerning the development of formable high-strength steel sheets.

I have read and am familiar with the Official Action dated June 15, 2009 and JP '941 utilized to reject the claims in this Application. I do not believe that the claims are obvious over the JP '941 disclosure. This Declaration contains Figs. 1 and 2 which were compiled to demonstrate the unexpected characteristics that we discovered relative to the prior art generally and JP '941 in particular.

We made a significant and non-obvious advance over the prior art as embodied in JP '941. It can be seen that JP '941 contains V in an amount of as much as 0.1 to 0.5%. This is a large amount of V. The consequence of the presence of this large amount of V is that the VC is precipitated during hot rolling. This is a problem. The reason is that VC in the steel severely increases the deformation resistance in subsequent hot rolling steps. This means that a reduction ratio of 70% is essentially unachievable and, as a consequence, steels containing that much V in

the form of precipitated VC are inapplicable to commercial scale production. This essentially renders JP '941 as a theoretical type of steel not well adapted for practical production realities.

There is a further problem with the utilization of this quantity of V in that V is quite expensive and the costs of V continue to rise. Thus, utilization of large quantities of V is again impractical. However, our steels are not steels simply wherein V is supplemented with Nb as disclosed by JP '941. Instead, we have a different motivation in utilizing Nb. Nb is controlled to a very small value to leave solid solution C present in the steel so that there is a small amount of NbC and no VC precipitated in the steel. This allows us to maintain excellent deep drawability as reflected in an r value of 1.2 or more while maintaining TS at 440 MPa or more. Moreover, elimination of V and controlling Nb allows for reduction ratios of 70% or even more during cold rolling because the deformation resistance due to the presence of VC and Nb in large amounts is eliminated.

This is shown in the attached Fig. 1. The graph shows "x's" in various locations. These are reflective of JP '941 steels. Although the r values in JP '941 are improved, the problem is that there is excessive presence of precipitated VC because the amount of C in the solid solution state is reduced. An additional problem is that TS is lowered along with the reduction of C in the solid solution. Thus, to secure a TS of about 440 MPa or more, it is necessary to add not only V, but also Nb and Ti in large quantities.

We discovered something quite unexpected. We were able to achieve an excellent r value of about 1.2 or more without reducing the amount of C in solid state solution as exhibited with the O in Fig. 1. Moreover, as shown in Fig. 2, a steel plate having TS of at least 440 MPa and an r value of at least 1.2 or more is possible to be manufactured by just adding Nb and Ti in small quantities. This is completely beyond the expectations of one skilled in the art based on the

teachings of JP '941.

The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and thus such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: August 26, 2009 Kaneharu Okuda

Kaneharu Okuda, Co-inventor

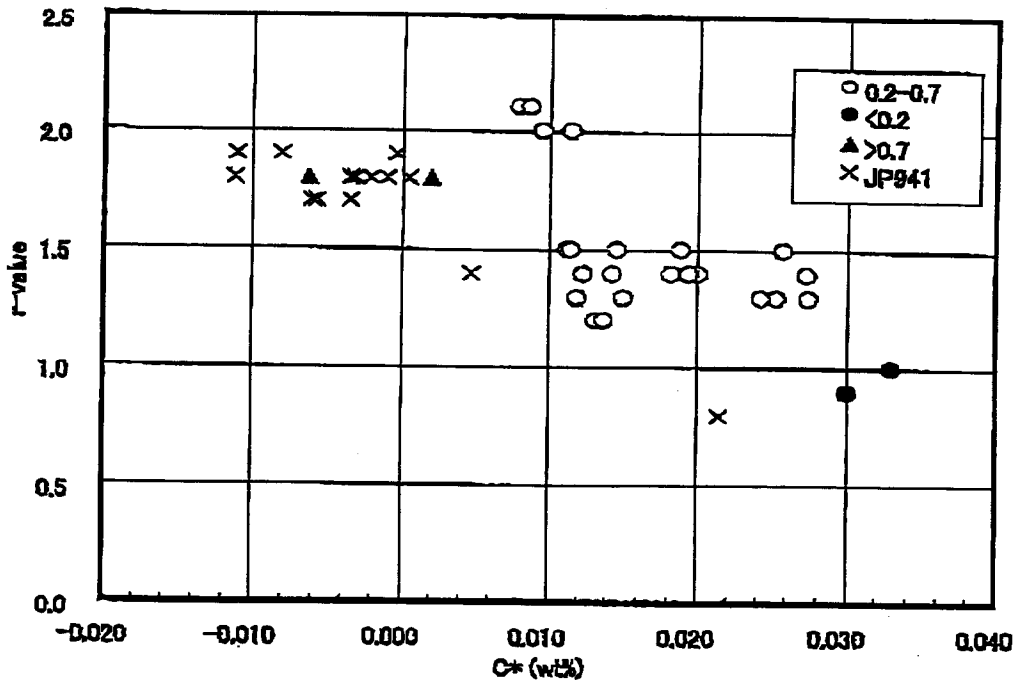

Fig. 1 RELATIONSHIPS BETWEEN C* AND r VALUE
wherein, C*=C-(12/93)Nb -(12/51)V -(12/48)(Ti-(48/14)N).

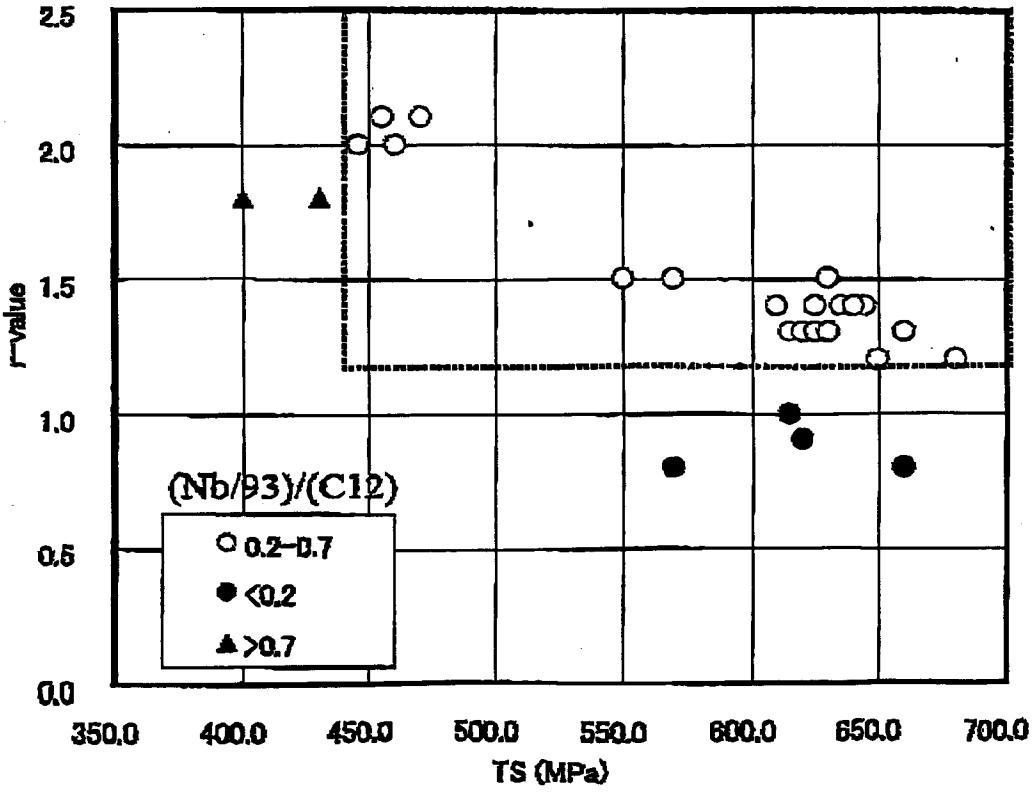

Fig. 2 RELATIONSHIPS BETWEEN TS AND r VALUE